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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/656,626	09/07/2000	Steven A. Clark	43420/118	7545

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FOLEY & LARDNER
777 EAST WISCONSIN AVENUE
MILWAUKEE, WI 53202

EXAMINER

COMBS, JANELL A

ART UNIT	PAPER NUMBER
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1742

DATE MAILED: 02/07/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/656,626

Applicant(s)

CLARK ET AL.

Examiner

Janelle Combs-Morillo

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 November 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 17-30 and 32-66 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 17-30 and 32-66 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 33-39, 46-52, 54-58 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shaffer et al (US 6,248,189) in view of the "ASM Handbook Vol. 9 Metallography and Microstructures" pp. 357-388 (hereinafter "ASM Handbook Vol 9").

Shaffer et al teaches a 6000 series (Table 1) cast (column 5 lines 10-11) aluminum alloy exhibiting: elongation =11%, UTS =59.3 ksi, YS =53.7 ksi (Table 3 , example 3B). Shaffer does not state that said alloy exhibits a "generally round grain structure". Applicant argues that the alloy taught by Shaffer is extruded, and one of skill in the art would expect an elongated grain structure rather than a "generally round grain structure". However, the examiner points out that the ASM Handbook Vol. 9 in Fig. 192, etc. of page 382 shows a micrograph of 6061-T6 extruded tube, wherein said alloy appears to have a "generally round grain structure" (as defined/described in the present specification). Often it is typical to obtain aluminum alloy microstructures that are recovered or partially recovered from heavy cold working reductions (for heat treatable alloys). The examiner submits that given the disclosures of ASM Handbook Vol. 9 and Shaffer, one of skill in the art would expect the cast and wrought alloy product as taught by Shaffer to have a "generally round grain structure", substantially as presently claimed (and as defined/described in the present specification).

Concerning claim 39, Shaffer does not teach the hardness of said alloy. However, because Shaffer teaches substantially the same 6000 series aluminum alloy product as presently claimed, then substantially the same properties, such as hardness, are held to be present. The examiner asserts that “products of identical chemical composition can not have mutually exclusive properties.” *In re Spada*, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990). A chemical composition and its properties are inseparable. Where the claimed and prior art products are identical or substantially identical in structure or composition, a prima facie case of either anticipation or obviousness has been established. *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977). Therefore, if the prior art teaches the identical chemical structure, the properties applicant discloses and/or claims are necessarily present. It is held that Shaffer et al has created a prima facie case of obviousness of the presently claimed invention.

Concerning claims 46-59, Shaffer does not mention micropores, microshrinkage defects, or intergranular voids. However, the presently claimed limits are held to be within level of one of skill in the art, given the disclosure of Shaffer (additionally, these defects are not typically troublesome for wrought alloys). Because the claimed and prior art products are substantially identical in structure and composition, a prima facie case of obviousness has been established.

Concerning claim 54, with regard to the process steps, it is well settled that a product-by-process claim defines a product, and that when the prior art discloses a product substantially the same as that being claimed, differing only in the manner by which it is made, the burden falls to applicant to show that any process steps associated therewith result in a product materially different from that disclosed in the prior art. See MPEP 2113, *In re Brown* (173 USPQ 685) and *In re Fessman* (180 USPQ 524) *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir.

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1985). Because the claimed and prior art products are substantially identical in structure and composition, and applicant has not shown process steps associated therewith result in a product materially different from that disclosed in the prior art, a prima facie case of obviousness has been established.

3. Claims 17, 18, 20, 21, 25, 30, 32, and 40-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kroger (US 3,791,876).

Kroger teaches an aluminum alloy product (column 1 lines 32-38), as presently claimed in instant claim 17, wherein said product is an Al-Zn alloy (instant claims 21 and 30) “substantially free from porosity” (instant claim 18, see Kroger column 1 lines 67-68) that falls within the compositional limits of AA7075 (instant claim 25). Kroger teaches that said Al-Zn alloy exhibits an elongation of 7% (Table 1).

Kroger does not teach (a) a process of producing said aluminum alloy by centrifugally casting and then hot isostatically processing (instant independent claim 17), (b) said alloy has “sufficient fluidity as a melt for centrifugal casting” (instant claim 20), or (c) “a tensile strength, a yield strength and an elongation meeting ASTM wrought specifications” (instant claim 32).

However, with regard to the process steps (item (a)), it is well settled that a product-by-process claim defines a product, and that when the prior art discloses a product substantially the same as that being claimed, differing only in the manner by which it is made, the burden falls to applicant to show that any process steps associated therewith result in a product materially different from that disclosed in the prior art. See *In re Brown* (173 USPQ 685) and *In re Fessman* (180 USPQ 524).

Concerning item (b), the examiner asserts that because the prior art teaches substantially the same alloy product as presently claimed, then substantially the same characteristics, such as fluidity, would be expected to be present.

Concerning item (c), the examiner asserts that given the disclosure of Kroger (who teaches a combined casting and forging of aluminum alloys, abstract), it would have been within the level of one of ordinary skill in the art to achieve a TS, YS, and elongation within the ASTM wrought specifications.

Because Kroger teaches an aluminum alloy product substantially the same as the presently claimed product, it is held that Kroger has created a prima facie case of obviousness of the presently claimed invention.

Concerning claims 40-45, Kroger does not mention micropores, microshrinkage defects, or intergranular voids. However, because Kroger teaches said Al-Zn alloy product is “substantially free from porosity” (instant claim 18, see Kroger column 1 lines 67-68), then one of ordinary skill in the art would expect negligible pores, voids, and microshrinkage defects.

4. Claims 17, 18, 21, 32, and 40-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yaney et al (US 5,520,754).

Yaney et al teaches an aluminum alloy product (column 1 line 6), as presently claimed in instant claim 17, wherein said product is an Al-Li alloy (instant claim 21) with porosity eliminated by HIPing (instant claim 18, see Yaney column 4 lines 16-17). In Figures 11-12 and column 9 lines 47, Yaney teaches the DC casting of AA8090 (instant claim 26). Yaney teaches that said Al alloy exhibits an elongation up to 8% (Fig. 4c).

Yaney does not teach (a) a process of producing said aluminum alloy by centrifugally casting and then hot isostatically processing (instant independent claim 17), (b) said alloy has “sufficient fluidity as a melt for centrifugal casting” (instant claim 20), or (c) “a tensile strength, a yield strength and an elongation meeting ASTM wrought specifications” (instant claim 32). Concerning item (a), as stated above, it is well settled that a product-by-process claim defines a product, and applicant has not shown that the presently claimed product is materially different from that disclosed in the prior art. Concerning item (b), the examiner asserts that because the prior art teaches substantially the same alloy product as presently claimed, then substantially the same characteristics, such as fluidity, would be expected to be present. Concerning item (c), the examiner asserts that given the disclosure of Yaney (who teaches a combined DC casting and HIPping of aluminum alloys), it would have been within the level of one of ordinary skill in the art to achieve a TS, YS, and elongation within the ASTM wrought specifications.

Because Yaney teaches an aluminum alloy product substantially the same as the presently claimed product, it is held that Yaney has created a prima facie case of obviousness of the presently claimed invention.

Concerning claims 40-45, Yaney does not mention micropores, microshrinkage defects, or intergranular voids. However, because Yaney teaches the absence of porosity, then one of ordinary skill in the art would expect negligible pores, voids, and microshrinkage defects.

5. Claims 17-21, 23, 24, 26, 27, 28, 32, 40-45, and 53-58 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhou et al (US 6,120,625).

Zhou et al teaches an aluminum alloy product (column 4 line 8), as presently claimed in instant claim 17, wherein said product is preferably AA6061 (instant claims 21, 23, 24, 27, and

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28) with porosity eliminated by sintering (column 3 lines 12-13, column 6 line 23). Zhou teaches that said Al alloy exhibits an elongation up to 8% (Fig. 4c). Zhou teaches spheroidal particles that have an average grain size of 30-150 μm , which overlaps the presently claimed grain size in instant claim 19.

Zhou does not teach (a) a process of producing said aluminum alloy by centrifugally casting and then hot isostatically processing (instant independent claims 17 and 54), (b) said alloy has “sufficient fluidity as a melt for centrifugal casting” (instant claim 20), or (c) “a tensile strength, a yield strength and an elongation meeting ASTM wrought specifications” (instant claim 32). Concerning item (a), as stated above, it is well settled that a product-by-process claim defines a product, and applicant has not shown that the presently claimed product is materially different from that disclosed in the prior art. Concerning item (b), the examiner asserts that because the prior art teaches substantially the same alloy product as presently claimed, then substantially the same characteristics, such as fluidity, would be expected to be present. Concerning item (c), the examiner asserts that given the disclosure of Zhou (who teaches a combined sintering and extruding of aluminum alloys), it would have been within the level of one of ordinary skill in the art to achieve a TS, YS, and elongation within the ASTM wrought specifications.

Because Zhou teaches an aluminum alloy product substantially the same as the presently claimed product, it is held that Zhou has created a prima facie case of obviousness of the presently claimed invention.

Concerning claims 40-45, 54, and 57, Zhou does not mention the presence of defects including” micropores, microshrinkage defects, or intergranular voids. On the contrary, Zhou

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teaches that porosity is eliminated. Therefore it is held that the aluminum alloy product taught by Zhou contains a negligible amount of said structural defects.

6. Claims 17, 18, 20-22, 26, 29, 32, and 40-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pickens et al (US 5,032,359).

Pickens teaches an aluminum alloy product (abstract), as presently claimed in instant claim 17, wherein said product is preferably an Al-Cu alloy (instant claims 21 and 29) with negligible porosity (instant claim 18, see Pickens column 9 lines 8-9, 26-27). Pickens teaches an Al-Cu-Li alloy composition (Table 1) that overlaps the alloy composition as presently claimed in claim 22. Pickens teaches that said Al alloy exhibits an elongation $\geq 4\%$ (instant claim 31, see Pickens Fig. 18).

Pickens does not teach (a) a process of producing said aluminum alloy by centrifugally casting and then hot isostatically processing (instant independent claim 17), (b) said alloy has “sufficient fluidity as a melt for centrifugal casting” (instant claim 20), or (c) “a tensile strength, a yield strength and an elongation meeting ASTM wrought specifications” (instant claim 32). Concerning item (a), as stated above, it is well settled that a product-by-process claim defines a product, and applicant has not shown that the presently claimed product is materially different from that disclosed in the prior art. Concerning item (b), the examiner asserts that because the prior art teaches substantially the same alloy product as presently claimed, then substantially the same characteristics, such as fluidity, would be expected to be present. Concerning item (c), the examiner asserts that given the disclosure of Pickens (who teaches a casting and extruding of aluminum alloys, column 14 lines 49-50), it would have been within the level of one of ordinary skill in the art to achieve a TS, YS, and elongation within the ASTM wrought specifications.

Because Pickens teaches an aluminum alloy product substantially the same as the presently claimed product, it is held that Pickens has created a prima facie case of obviousness of the presently claimed invention.

Concerning claims 40-45, Pickens does not mention micropores, microshrinkage defects, or intergranular voids. On the contrary, Pickens teaches said alloy has negligible porosity. Therefore it is held that the aluminum alloy product taught by Pickens contains a negligible amount of said structural defects.

7. Claims 59-66 are rejected under 35 U.S.C. 103(a) as being unpatentable over “ASM Handbook Vol. 9 Metallography and Microstructures” pp. 357-388 (hereinafter “ASM Handbook Vol 9”) in view of “Metals Handbook: Desk Edition” p 464.

“ASM Handbook Vol 9” Fig 235 shows a micrograph of AA 7075-T651 alloy that has a “generally round grain structure”, and shows no evidence of microshrinkage defects. “ASM Handbook Vol 9” does not teach a) the typical mechanical properties for AA 7075-T651 or b) the presently claimed process steps.

Concerning item a), “Metals Handbook: Desk Edition” p 464 teaches that AA 7075-T651 typically exhibits a UTS = 83 ksi, YS = 71 ksi, an elongation of 11%, and a Brinell Hardness of 150 at a 500 kg load (see footnote on Table 3).

Concerning item b), with regard to the process steps, it is well settled that a product-by-process claim defines a product, and that when the prior art discloses a product substantially the same as that being claimed, differing only in the manner by which it is made, the burden falls to applicant to show that any process steps associated therewith result in a product materially different from that disclosed in the prior art. See MPEP 2113.

The 7075-T651 alloy product shown with a “generally round grain structure” by “ASM Handbook Vol 9” Fig 235 would be expected to have the mechanical properties detailed by “Metals Handbook: Desk Edition” p 464, because the alloy composition and temper are identical. Furthermore, because the claimed and prior art products are substantially identical in structure and composition, and applicant has not shown process steps associated therewith result in a product materially different from that disclosed in the prior art, a prima facie case of obviousness has been established.

Response to Amendment/Arguments

8. In the response filed on September 26, 2002, applicant canceled claim 1, amended claims 47-49, added new claims 52 and 53. In the supplemental response filed on November 19, 2002, applicant amended claims 43-45, 51-53, and added new claims 54-66.

Applicant’s argument that the present invention is allowable over the prior art of record because the alloy taught by Shaffer is extruded, and one of skill in the art would expect an elongated grain structure rather than a “generally round grain structure”, has not been found persuasive. As stated above, the examiner points out that the ASM Handbook Vol. 9 page 382 shows a micrographs of 6061-T6 extruded tube, wherein said alloy appears to have a “generally round grain structure” (as defined/described in the present specification). The examiner points out that often it is typical to obtain aluminum alloy microstructures that are recovered or partially recovered from heavy cold working reductions (for heat treatable alloys).

Applicant’s argument that the present invention is allowable over the prior art of record because Kroger teaches substantially working of said alloy, has not been found persuasive. As

stated above, the examiner points out that often it is typical to obtain aluminum alloy microstructures that are recovered or partially recovered from heavy cold working reductions (for heat treatable alloys). See ASM Handbook Vol. 9 Fig. 74, 46, 235, etc.

Applicant's argument that the present invention is allowable over the prior art of record because Yaney is drawn to an aluminum alloy that has undergone metal working steps, has not been found persuasive. Fig. 1B of Yaney shows a "generally round grain structure".

Applicant's argument that the present invention is allowable over the prior art of record because Fig 3B of Zhou shows the microstructure after being heated to a semi-solid temperature (not the finished product), has not been found persuasive. Though Fig. 3 B does not show the finished product, one of skill in the art would expect the semi-solid forming process taught by Zhou to result in a spheroidal structure because Zhou teaches at column 9 lines 4-10:

"After semi-solid forming and solidifying the metal composition, therefore, fine grained microstructure with average grain size of 50 to 150 μm comprising discrete spheroidal grains uniformly distributed in a lower melting matrix is obtained in the metal composition, resulting in a product with superior mechanical properties."

Therefore, one of skill in the art would expect the product of Zhou to have a "generally round grain structure", substantially as presently claimed.

In summary, the examiner submits that the prior art wrought products qualify for a "generally round grain structure", substantially as presently claimed and as (broadly) defined and described in the present specification. The examiner recognizes that "grains are seldom completely equiaxed in most wrought aluminum alloys" (see ASM Handbook Vol. 9 page 357, 3rd column, 2nd paragraph, emphasis added), however, worked alloys can be 'substantially equiaxed', or rather exhibit a "generally round grain structure", as seen in the example micrographs of ASM Handbook Vol. 9. Therefore, it is held that the presently claimed alloy

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product, complete with a generally round grain structure and lack of microshrinkage defects, etc. is known in the art.

With regard to the product by process claims, the examiner points out that applicant has not shown that the presently claimed product is materially different from that disclosed in the prior art. The examiner suggests that the applicant provide evidence that an alloy product, processed by providing a molten body, centrifugally casting, and hot isostatically processing (as presently claimed), exhibits specific unexpected results with regard to the alloy product produced by the prior art of record.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.


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10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Janelle Combs-Morillo whose telephone number is (703) 308-4757. The examiner can normally be reached on 7:30 am- 4:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (703) 308-1146. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-7719 for regular communications and (703) 305-7719 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.


GEORGE WYSZOMIERSKI
PRIMARY EXAMINER

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February 5, 2003